CLAIMS

1. An optical film comprising a transparent polymer film layer and a birefringent layer formed of a non–liquid crystalline polymer that are laminated together, wherein the birefringent layer satisfies a condition represented by the following formula (1), and the transparent polymer film layer has an in–plane retardation of not more than 50 nm:

$$nx \geq ny > nz \quad (1)$$

in the formula (1), nx, ny and nz indicate respectively refractive indices in an X–axis direction, a Y–axis direction and a Z–axis direction in the birefringent layer; the X–axis direction is a direction showing a maximum refractive index within the plane of the birefringent layer, the Y–axis direction is a direction perpendicular to the X–axis direction within the plane, and the Z–axis direction is a thickness direction and is perpendicular to the X–axis direction and the Y–axis direction.

2. The optical film according to claim 1, wherein a birefringence $\Delta n(a)$ of the birefringent layer and a birefringence $\Delta n(b)$ of the transparent polymer film layer satisfies a condition represented by the following formula (2):

$$\Delta n(a) > \Delta n(b) \times 10 \quad (2).$$

3. The optical film according to claim 1 or 2, wherein a birefringence (Δn) of the entire optical film is in a range of 0.0005 to 0.5.

4. The optical film according to any of claims 1 to 3, wherein the non–liquid crystalline polymer for forming the birefringent layer is at least one kind of polymer selected from the group consisting of polyamide, polyimide, polyester, polyetherketone, polyamideimide and polyesterimide.

5. The optical film according to any of claims 1 to 4, wherein a resin for forming the transparent polymer film layer is at least one resin selected from the group consisting of acetate resin, polyester resin, polyethersulfone resin, polysulfone resin, polycarbonate resin, polyamide resin, polyimide resin, polyolefin resin, acrylic resin, polynorbornene resin, cellulose resin, polyarylate resin, polystyrene resin, polyvinyl alcohol resin, polyvinyl chloride resin, polyvinylidene chloride resin, polyacrylic resin, a mixed resin thereof; a liquid crystal polymer; and a mixture of a thermoplastic resin whose side chain has a substituted or unsubstituted imide group and a thermoplastic resin whose side chain has a substituted or unsubstituted

phenyl group and a nitrile group.

6. The optical film according to any of claims 1 to 4, wherein the resin for forming the transparent polymer film layer is at least one of triacetylacetate and a mixed resin of an alternating copolymer composed of isobutene and N-methylene maleimide and an acrylonitrile–styrene copolymer.

7. The optical film according to any of claims 1 to 6, wherein the transparent polymer film layer is produced by shaping a material resin into a film and stretching.

8. The optical film according to any of claims 1 to 7, wherein the transparent polymer film layer is used as a transparent protective film for a polarizing plate.

9. A polarizing plate comprising an optical film and a polarizer, wherein the optical film is of any of claims 1 to 8.

10. The polarizing plate according to claim 9, wherein the transparent polymer film layer of the optical film functions also as a transparent protective film of the polarizing plate.

11. The polarizing plate according to claim 9 or 10, wherein the optical film functions as an optically–compensating layer.

12. A liquid crystal panel comprising a liquid crystal cell and an optical member, wherein the optical member is disposed on at least one surface of the liquid crystal cell, and is either the optical film according to any of claims 1 to 8 or the polarizing plate according to any of claims 9 to 11.

13. The liquid crystal panel according to claim 12, wherein the liquid crystal cell is at least one selected from the group consisting of an STN (Super Twisted Nematic) cell, a TN (Twisted Nematic) cell, an IPS (In-Plane Switching) cell, a VA (Vertical Aligned) cell, an OCB (Optically Compensated Birefringence) cell, a HAN (Hybrid Aligned Nematic) cell, and an ASAM (Axially Symmetric Aligned Microcell) cell.

14. A liquid crystal display comprising a liquid crystal panel according to claim 12 or 13.

15. A self-light-emitting display comprising at least one of the optical film according to any of claims 1 to 8 and the polarizing plate according to any of claims 9 to 11.

16. An organic EL display comprising at least one of the optical film according to any of claims 1 to 8 and the polarizing plate according to any of claims 9 to 11.

17. A method for producing an optical film comprising a transparent polymer film layer and a birefringent layer that are laminated together, the method comprising:

preparing or providing the transparent polymer film having an in-plane retardation of not more than 50 nm;

applying a non-liquid crystalline polymer solution on the transparent polymer film;

evaporating and removing a solvent in the solution so as to form the birefringent layer; and

adjusting the birefringent layer so as to satisfy a condition represented by the following formula (1):

$$nx \geq ny > nz \qquad (1)$$

in the formula (1), nx, ny and nz indicate respectively refractive indices in an X-axis direction, a Y-axis direction and a Z-axis direction in the birefringent layer; the X-axis direction is a direction showing a maximum refractive index within the plane of the birefringent layer, the Y-axis direction is a direction perpendicular to the X-axis direction within the plane, and the Z-axis direction is a thickness direction and is perpendicular to the X-axis direction and the Y-axis direction.

18. The method according to claim 17, wherein the birefringent layer and the transparent polymer film layer are formed such that a birefringence $\Delta n(a)$ of the birefringent layer and a birefringence $\Delta n(b)$ of the transparent polymer film layer satisfies a condition represented by the formula (2):

$$\Delta n(a) > \Delta n(b) \times 10 \qquad (2).$$

19. The method according to claim 17 or 18, wherein a birefringence (Δn) of the entire optical film is in a range of 0.0005 to 0.5.

20. The method according to any of claims 17 to 19, wherein the non-liquid

crystalline polymer for forming the birefringent layer is at least one kind of polymer selected from the group consisting of polyamide, polyimide, polyester, polyetherketone, polyamideimide and polyesterimide.

21. The method according to any of claims 17 to 20, wherein a resin for forming the transparent polymer film layer is at least one resin selected from the group consisting of acetate resin, polyester resin, polyethersulfone resin, polysulfone resin, polycarbonate resin, polyamide resin, polyimide resin, polyolefin resin, acrylic resin, polynorbornene resin, cellulose resin, polyarylate resin, polystyrene resin, polyvinyl alcohol resin, polyvinyl chloride resin, polyvinylidene chloride resin, polyacrylic resin, a mixed resin thereof; a liquid crystal polymer; and a mixture of a thermoplastic resin whose side chain has a substituted or unsubstituted imide group and a thermoplastic resin whose side chain has a substituted or unsubstituted phenyl group and a nitrile group.

22. The method according to any of claims 17 to 20, wherein the resin for forming the transparent polymer film layer is at least one of triacetylacetate and a mixed resin of an alternating copolymer composed of isobutene and N-methylene maleimide and an acrylonitrile–styrene copolymer.

23. The method according to any of claims 17 to 22, wherein the transparent polymer film layer is produced by shaping a material resin into a film and then stretching.

24. The method according to any of claims 17 to 23, wherein the transparent polymer film layer and the birefringent layer are laminated, and then the laminate is stretched or shrunk.